Formative Assessment: Preliminary Observations & Student Perceptions

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Introduction

Evidence exists that formative assessment can contribute to the support and development of students' learning and understanding (e.g. Yorke, 2003; Biggs, 2003; Rushton, 2005; Johnston & Kochanowska, 2009), and is pivotal in the context of life-long learning (Boud, 2000).

Writtle College is one of the largest providers of HE Horticulture courses in the UK, and attracts a diverse range of students from non-traditional science backgrounds. For success in their BSc (Hons) and FdSc awards in Horticulture underpinning knowledge of science is essential, and approaches are required to engage with a changing entry profile.

This two year study investigated students' perceptions of the value of formative assessment to their learning experience within a compulsory level 4 science module undertaken in their first semester. Pedagogically, the study was designed to help students make the transition into science-based HE courses.

Methods

Profiles (see Fig. 3) of the 68 students enrolled on HE Horticulture courses 2008-10 were compiled. All students were given the opportunity to undertake formative work, commencing in the first week of study. Elements of formative work, as staged practice towards summative assessment, included practical coursework, student exemplar work and assessment criteria, and formative multiple choice examination questions. Student views were obtained using a questionnaire (abridged from Glover, 2004).

Profiling data were subject to Principal Components Analysis (PCA), with subsequent analysis by Spearman's rank correlation (r_s). Statistical comparison of marks for coursework (for students that submitted all elements; n=48) were undertaken using Kruskal-Wallis, followed by *post-hoc* testing (Mann-Whitney *U*-test).

Results

The study group comprised slightly more males than females (54% and 46%, respectively). Of these 62% and 31% were registered on Honours and Foundation Degrees, respectively. The ages of students varied from 17 to 60y (median 24.5y), with 40% in the range 17-22y (Fig. 1) and 46% in the range 22-40y.

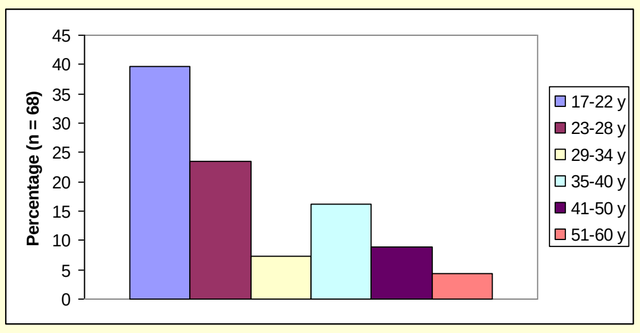

Fig. 1. Percent of students in different age classes.

With regard to academic qualifications, most 55% of the students reported that they only possessed knowledge up to GCSE level in science (Fig. 2).

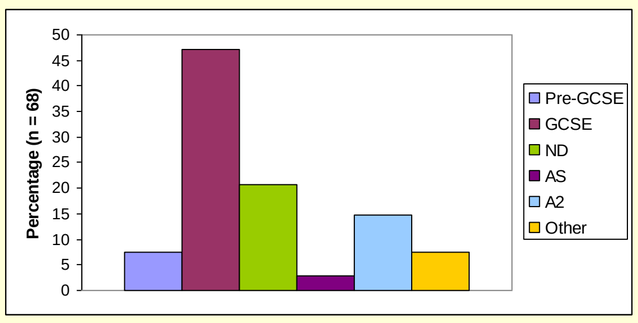

Fig. 2. Percent of students with highest level of study in science.

Emerging patterns from PCA indicated potential relationships between baseline, academic qualification and perception of scientific knowledge (Fig. 3), confirmed by significant positive r_s ($p<0.01$ or better for each paired combination of the three variables).

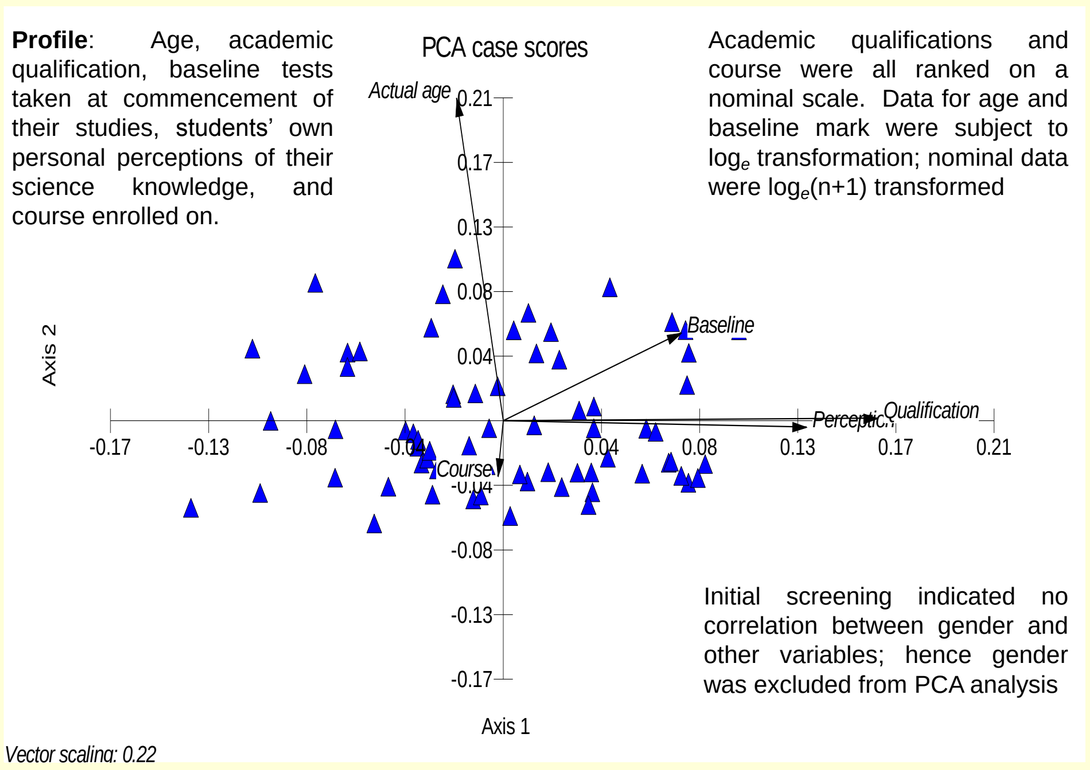

Fig. 3. PCA of student profile data

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Feedback from 65 students (Table 1) revealed over 95% agreement for all fourteen questions, indicating that the majority of students felt that formative assessment had helped with various aspects of their learning and understanding.

Table 1. Examples of questions and student responses

	% response (n = 65)		
	Level of agreement		
Question	**None**	**Some**	**A lot**
Helped me to understand what is expected	**1.5**	**15.4**	**83.1**
Helped me to understand what I was doing right	**1.5**	**21.5**	**76.9**
Helped me to understand what I was doing wrong	**1.5**	**18.5**	**80.0**
Helped to develop my confidence in tackling the practicals	**1.5**	**20.0**	**78.5**
Helped me to develop my learning and academic skills	**1.5**	**36.9**	**61.5**
The feedback made it clear what I need to do to improve	**0**	**16.9**	**83.1**
Helped me to develop my subject knowledge	**0**	**13.8**	**84.6**

The positive responses were supported by free text comments in the questionnaire:

"*Very reassuring to have practice before the final assessment and time to talk it over with tutors*"

"*This was the most useful part as we could learn from our mistakes and improve*"

"*… gave me clear individual guidance on progress, which is essential to monitor your own development and knowledge*"

"*I felt I improved each time due to constructive feedback and suggestions*"

Marks for the practical coursework indicated a pattern of improvement, with marks increasing significantly in a stepwise manner (Fig. 4).

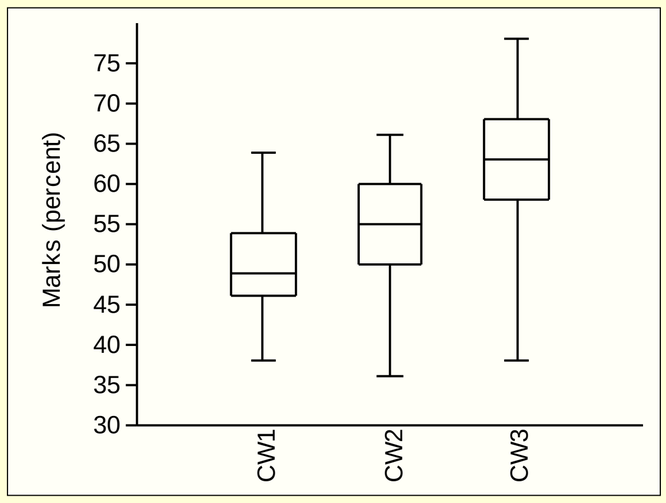

Fig. 4. Comparison between assessment marks for formative elements (CW1 & CW2) and summative assessment (CW3) (n = 48). CW1 and CW2 were submitted in weeks 3 and 6, respectively. CW3 was submitted in week 13. The data are significant Kruskal-Wallis; $p<0.001$; all elements are significantly different from each other (Mann-Whitney; $p<0.01$)

Conclusions

The diverse intake of students reflects the widening participation agenda, and curriculum and assessment must be designed to take this into account, without compromising academic standards.

Although there is some indication that staged formative assessment improves attainment (Fig. 4), our focus relates to student perceptions. The results suggest that students felt that their effort in engaging with the process accrued benefits, particularly with respect to academic expectations and learning enhancement. Feedback was pivotal in establishing important dialogue between students and tutors, creating a student-supported learning environment.

Emphasis has been placed on front loading formative approaches in the first semester to ensure that students actively engage with feedback and act on it to feed forward, and develop transferable and metacognitive skills to facilitate both transition and academic progression.

Further studies are planned to broaden our study to include students undertaking other science-based disciplines in their first year of study, thereby facilitating a cross-modular, strategic approach, and a shift in pedagogic culture.

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